

Claims

1. Method for transporting powdery substances, wherein the powder to be transported is alternately drawn into a pump chamber (3) through an inlet (11) and transported into an outlet (12) by means of transport gas introduced into the pump chamber (3) in cyclic fashion, characterized by the fact that the vacuum generated when drawing the powder into the pump chamber (3) is controlled by means of an inlet opening (15) of the pump chamber (3).
2. Method according to Claim 1, characterized by the fact that the powder to be transported is drawn into the cylinder (2) through an inlet (11) by a piston (4) that moves back and forth in the cylinder (2), during a piston movement in one direction, wherein a movement of the piston (4) in the opposite direction causes the powder to be transported into an outlet (12) of the cylinder (2) by means of the transport gas introduced into the cylinder (2), and by the fact that the vacuum generated by the piston (4) during its suction movement in the cylinder (2) is controlled by means of an inlet opening (15) of the cylinder (2).
3. Method according to Claim 1 or 2, characterized by the fact that the vacuum is controlled by the inflow of transport gas.
4. Method according to one of the preceding claims, characterized by the fact that the vacuum is controlled by regulating the opening time and/or opening width of an inlet valve (18,18').

5. Method according to one of Claims 2-4, characterized by the fact that the powder is drawn into the inlets (11,11') of two cylinders (2,2') with oppositely moving pistons (4,4') and transported into a common output line (37") of both cylinders.
6. Method according to Claim 5, characterized by the fact that each piston (4,4') is driven by a preferably pneumatic drive cylinder unit (5,5').
7. Method according to one of the preceding claims, characterized by the fact that the powder is drawn into one of the two chambers or cylinder units (2,3) while the powder is ejected from the other unit (2',3').
8. Method according to one of the preceding claims, characterized by the fact that the inlets and outlets (11,12) for the powder are opened and closed by automatically controlled actuating elements (33,34) that are mechanically connected to one another.
9. Method according to Claim 8, characterized by the fact that the inlets and outlets (11,12) are closed by automatically pinching off hoses (36,37) of an elastic material.

10. Device for transporting powdery substances with at least one pump chamber (3) that is connected to a powder reservoir via a valve-controlled inlet (11) and to the powder receiver via a valve-controlled outlet (12), and with a device that alternately draws the powder into the pump chamber (3) through the inlet (11) and transports the powder into the outlet (12) by means of a transport gas introduced into the pump chamber (3) in cyclic fashion, characterized by the fact that a control device (18,24) is provided for changing the vacuum generated during the suction process in the pump chamber (3) while the pump is in operation.
11. Device according to Claim 10, characterized by the fact that at least one cylinder (2) is provided in which a piston (4) can be moved back and forth by means of a drive unit (5), where said cylinder contains an inlet (11) and an outlet (12) for the powder to be transported, as well as an inlet opening (15) for a transport gas, wherein the piston (4) draws the powder into the cylinder (2) through the inlet (11) during its movement in one direction and the piston (4) transports the powder into the outlet (12) by means of the transport gas introduced into the cylinder (2) during its movement in the opposite direction, and wherein a device (18, 24) for controlling, independently of the piston movement, the vacuum generated in the cylinder (2) during the suction movement of the piston (4) is connected to the cylinder (2).
12. Device according to Claim 11, characterized by the fact that the device for controlling the vacuum regulates a valve (18) arranged upstream of the transport gas inlet (15).

13. Device according to Claim 11 or 12, characterized by the fact that the aforementioned piston (4) is mechanically connected to the piston (6) of the drive cylinder unit (5).
14. Device according to one of Claims 11-13, characterized by the fact that the end of the cylinder (2) which is located opposite to the powder inlet (11) is closed by a seal (10) that surrounds the piston (4), and by the fact that a gap (9') for the transport gas is formed between the piston (4) that can be displaced in the seal (10) in sliding fashion and the inner wall of the cylinder (2), in the region between the seal (10) and the powder outlet (12).
15. Device according to one of Claims 11-14, characterized by the fact that the transport gas inlet (15) is located on or near the sealed end of the pump chamber (3) of the cylinder (2) which is located opposite to the powder inlet (11).
16. Device according to one of Claims 11-15, characterized by the fact that it contains two cylinders (2,2') with two oppositely driven pistons (4,4'), and by the fact that these cylinders (2,2') respectively contain a powder inlet (11,11'), a transport gas inlet (15,15') and a powder outlet (12,12').
17. Device according to Claim 16, characterized by the fact that both cylinders (2,2') are arranged parallel to one another in a common housing (1).
18. Utilization of the device according to one of Claims 11-17 as a powder metering pump for supplying the atomizer of a powder coating machine.